DOCUMENT RESUME

ED 254 210 IR 011 525

AUTHOR	Geisert, Paul; Futrell, Mynga
TITLE	Computer Literacy for Teachers. ERIC Digest.
INSTITUTION	ERIC Clearinghouse on Information Resources, Syracuse, N.Y.
SPONS AGENCY	National Inst. of Education (ED), Washington, DC.
PUB DATE	May 84
CONTRACT	400-77-0015
NOTE	3p.
AVAILABLE FROM	ERIC Clearinghouse on Information Resources, 030 Huntington Hall, Syracuse University, Syracuse, NY 13210 (free).
PUB TYPE	Information Analyses - ERIC Information Analysis Products (071)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Computer Assisted Instruction; *Computer Literacy; *Computer Science Education; *Definitions; *Educational Objectives; Higher Education; *Programing; *Teacher Education Curriculum; Teachers
IDENTIFIERS	Computer Uses in Education; ERIC; ERIC Digests

ABSTRACT

This digest summarizes diverse viewpoints in the controversy over the meaning and practice of "computer literacy." The issue of whether being able to read and write computer programs should be a a computer literacy requirement for teachers is specifically addressed. Attempts to define computer literacy goals for teachers are noted, including those by Rawitsch (1981) and the states of Texas and North Carolina, as well as de facto definitions resulting from program development. It is suggested that a major problem with the term "computer literacy" is that it confounds two ideas: the computer as a classroom tool and the computer as a subject of instruction. Conclusions indicate that the specific skills and knowledge that constitute computer literacy remain undefined, and that teachers need to specify their own computer literacy needs and pursue their own individual computer literacy education plans. Twenty-six references are listed. (LMM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

BEST COPY AVAILABLE

ED254210

ERIC

ERIC Clearinghouse
on Information Resources

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Syracuse University • School of Education • Syracuse, New York 13210 • (315) 423-3640

ERIC DIGEST

COMPUTER LITERACY FOR TEACHERS

Teacher computer literacy is now well-established within and without the educational community (Martin and Heller, 1982). This rather unfortunate term is, however, a perfect example of what Mager (1972) calls a "fuzzy," and much controversy has arisen over the concepts projected by the term, and over attempts to produce computer-literate teachers.

The Programming Issue

The "literacy" portion of the term immediately brings to mind the concept of reading and writing—hence the tendency is to think that computer-literate teachers should be able to read and write computer programs. Some writers appear to equate programming with computer literacy (Vockell and Rivers, 1983); others see reading and writing computer programs as a necessary part of the concept (Dennis, 1979). The Association of Computing Machinery, in defining the scope and substance of teacher training needed to integrate computing into the school, exemplifies the latter position. Its set of competencies, developed in 1980, includes the ability to: (1) read and write simple computer programs, (2) use computer programs and documentation which are educational in nature, (3) use computer terminology, particularly as it relates to hardware, (4) recognize educational problems that can and cannot be solved using the computer, (5) locate information on computing as it relates to education, (6) discuss the historical development of computer technology as it relates to education, and (7) discuss the moral and human impact issues as they relate to the societal use of computers as well as the educational use of computers (Taylor et al. 1980).

At the other end of the spectrum is the view that one can be naive about what is going on inside of a computer and still use it effectively as an instructional tool (Bruchmann, 1980). Although the bulk of writings falls somewhere between the above (Jay, 1981; Moursund, 1982; Rawitsch, 1981; Anderson et al., 1980), the fact remains that there is no generally accepted operational definition for the more comprehensive set of knowledge and skills to be associated with teacher computer literacy.

Producing Computer-Literate Teachers

Individuals and groups have proposed various computer literacy goals for teachers. Rawitsch (1981) outlined six major goal areas to be accomplished in sequence: (1) operating computers, (2) using computer applications, (3) integrating applications into curricula, (4) evaluating applications, (5) designing new applications, and (6) programming computers. To guide the development of computer study for educators, the state of Texas (1982) identified over 50 competencies in 10 broad goal areas that all public school teachers should acquire.

Concern over defining and teaching computer literacy has led to the development by the state of North Carolina (1983) of a State Plan for Computer Utilization in North Carolina Public Schools, which identifies several essential elements to include in a computer literacy program for teachers: (1) activities to overcome negative attitudes or fears, (2) opportunities for users to become familiar with basic components of a microcomputer, (3) a description of what computers and computer programs can and cannot do, (4) an introduction to computer programming, (5) sources of information about computers and software, and (6) discussion on the impact of computers on society (Foell, 1983).

Despite lack of consensus on the nature of teacher computer literacy, educators have produced de facto definitions through program development. Nordman (1982), in preparing a microcomputer inservice program, blended the computer literacy models of Diem (1981), Moursund (1982) and Rawitsch (1981) to form a foundation of competencies for his workshop. Anderson (1983) cites as examples of programs in teacher training institutions Arizona State University, Columbia University Teacher's College, Stanford University, North Texas State University, and Lesley College. According to the American Association for Higher Education—ERIC Higher Education Research Report No. 6 (Masat, 1981), however, teacher training programs on the whole presently neglect computers. Bitter (1983) believes that computer literacy has to be included in teacher certification requirements.

One of the best-known endeavors to help teachers in the field gain computer literacy is the Minnesota Educational Computing Consortium (MECC). In addition to providing extensive inservice training of teachers, the MECC offers instructional computing assistance, technical support, management information services, and materials and software development (Rawitsch, 1982).

Focus for a "Fuzzy"—Differing Teacher Needs

In additional to the diversity in both the viewpoints concerning its meaning and practices that take place in its name, the term confounds two ideas: (1) the computer as a classroom tool, and (2) the computer as a subject of instruction.

In the classroom a computer may serve a teacher as a medium of instruction (e.g., CAI, drill-and-practice, and simulation); as a means to manage instruction (e.g., gradebook, diagnostic testing, lesson prescription, and CMI); and in various other ways (e.g., in producing worksheets, printing home reports, managing data files, producing tests, and word processing) (Watts,

IR011525

BEST COPY AVAILABLE

1981). Computing is also becoming increasingly important as the subject of instruction. The literature reveals a growing consensus that every student should acquire some computer literacy by the secondary level (National Council of Teachers of Mathematics, 1978; Klassen, 1981; Molnar, 1979). Teachers who are going to be teaching computing or computer literacy to students need different competencies than teachers who only intend to utilize a computer in their teaching, while teachers who neither use nor teach about computers have only the more general needs of any college-educated citizen.

Who Should Know What?

The specific skills and knowledge to equate with teacher computer literacy remain undefined. Amid the welter of discussion on the "true meaning" of computer literacy for teachers, however, order can be brought out of chaos by attending to established principles of systematic curriculum design to establish concrete meaning for abstract concepts (Mager, 1972, 1975).

Davis (1983) has stated a concept that may foster unity of thought concerning the defining of teacher computer literacy: "The quarrel about the value of one knowledge over another is empty precisely because it ignores the individual who engages the knowledge... (An) example of this is computer literacy. Mandates for such courses often ambiguously include both awareness of the role of computers in society and skill in basic programming. The vacuousness of the mandates is matched only by the exaggeration of their need.... Responsible curriculum choice must always attend to what knowledge for whom and for what possible uses" (p. 59). To those who accept this premise, there can be no such thing as a set of skills or body of knowledge that defines computer literacy for all teachers—individual teachers need specific competencies to deal with specific classroom situations. Moursund (1983) directs teachers to specify their own computer literacy needs, and to pursue their own individual computer literacy education plans (ICLEPs).

REFERENCES

Anderson, C. A. Computer literacy: Changes for teacher education. *Journal of Teacher Education*, September/October 1983, *34*(5), 6-9.

Anderson, R. E., Klassen, D. L., and Johnson, D. C. In defense of a comprehensive view of computer literacy—A reply to Luehrmann. *Mathematics Teacher*, 1981, *74*, 687-690.

Bitter, G. Computer literacy for teacher certification. *Educational Computer Magazine*, 1983, *3*(1), 22.

Bruchmann, H. Let's get our priorities straight. *The Computing Teacher*, 1980, *8*(4), 45.

Davis, O. L., Jr. Liberating learning. *Educational Leadership*, October 1983, 58-60.

Dennis, J. R. *Teacher education in the use of computers*. Illinois Series on Educational Applications of Computers, Volume 1e. Urbana, IL: University of Illinois, Department of Secondary Education, 1979. (ERIC Document No. ED 183 181; microfiche only).

Diem, R. Developing computer education skills: An inservice training program. *Educational Technology*, 1981, *21*(2), 30-32.

Foell, N. A. A new concern for teacher educators: Computer literacy. *Journal of Teacher Education*, September/October 1983, *34*(5), 19-22.

Jay, T. B. Computerphobia: What to do about it. *Educational Technology*, 1981, *21*(1), 47-48.

Klassen, D. L. *A study of computer use and literacy in science education. Final report to NSF, 1978-1980*. Minneapolis, MN: Minnesota Educational Computing Consortium, 1980. (ERIC Document No. ED 191 712).

Mager, R. *Goal analysis*. Belmont, CA: Fearon Publishers, 1972.

Mager, R. *Preparing instructional objectives*. Palo Alto, CA: Fearon Publishers, 1975.

Martin, C. D., and Heller, R. S. Computer Literacy for teachers. *Educational Leadership*, October 1982, *40*(1), 46-47.

Masat, R. E. *Computer literacy in higher education. AAHE—ERIC/Higher Education Research Report Number 5*. Washington, DC: American Association for Higher Education, 1981. (ERIC Document No. ED 214 446).

Molnar, A. R. The next great crisis in American education: Computer literacy. *Journal of Educational Technology Systems*, 1978-79, 275-285.

Moursund, D. *What do teachers need to know? Will it make any difference?* Speech presented to Moving Microcomputers into the Mainstream of Education conference, University of Victoria, Victoria, BC, May 1982.

Moursund, D. ICLEP (Individual Computer Literacy Education Plan): A powerful idea. *The Computing Teacher*, 1983, *11*(4), 3-4.

National Council of Teachers of Mathematics. Computers in the classroom. *Mathematics Teacher*, 1978, *71*,468.

Nordman, R. *An effective microcomputer inservice: Designing and using awareness workshops*. Master of Education Project, University of Victoria, 1982. (ERIC Document No. ED 229 352).

North Carolina State Department of Public Instruction. *State plan for computer utilization in North Carolina public schools*. Raleigh, NC: Educational Media and Technology Services, 1983.

Rawitsch, D. G. Teaching educators about computers: A different ball game. *The Computing Teacher*, 1981, *9*(4), 27-32.

Rawitsch, D. G. Minnesota's statewide push for computer literacy. *Instructional Innovator*, February 1982, *27*(2), 34-35.

Taylor, R., Poirot, J., and Powell, J. Computing competencies for school teachers. *National Educational Computing Conference Proceedings*, 1980, 130-136. (ERIC Document No. ED 194 060; microfiche only)

Texas, Office of the Deputy Commissioner for Professional Development and Support. *Essential computer competencies for educators*. Austin, TX: Texas Education Agency, 1982.

Vockell, E. L. and Rivers, R. Computer literacy for educators. An applied programming approach. *The Computing Teacher*, 1983, *10*(8), 61-63.

Watts, N. A dozen uses for the computer in education. *Educational Technology*, 1981, *21*(4), 18-22.

Prepared by Paul Geisert and Mynga Futrell, Coordinator(s) of Microcomputer Education, University of Wisconsin, Oshkosh, N/E Building Box 73, Oskhosh, WI 54901. May 1984.

This publication was prepared with funding from the National Institute of Education, U.S. Department of Education, under contract no. NIE-400-77-0015. The opinions expressed in this report do not necessarily reflect the positions or policies of NIE or ED.

BEST COPY AVAILABLE